Amendments to the claims:

In reading this, text added by the amendment is underlined, and cancelled text appears in strikethrough.

1. (Previously Cancelled)

2. (Currently Amended) A method of <u>generating soft value vectors for</u> soft decision decoding <u>within a TPC system</u>, the method comprising the steps of:

    a. receiving an input signal over a channel; and

    b. approximating a Log-Likelihood-Ratio result of the input signal <u>using embedded software on the system</u>, wherein the Log-Likelihood-Ratio result is independent of a signal to noise ratio value calculable over the channel.

3. (Currently Amended) The method of ~~soft decision decoding according to~~ claim 2 wherein the step of approximating further comprises calculating an actual Log-Likelihood-Ratio value for each of a plurality of m bits per symbol contained in the input signal.

4. (Currently Amended) The method of ~~soft decision decoding according to~~ claim 3 wherein the step of approximating further comprises separating the actual Log-Likelihood-Ratio values into one or more n-regions, wherein n is an integer.

5. (Currently Amended) The method of ~~soft decision decoding according to~~ claim 4 wherein the step of approximating further comprises determining a constant, a_n, by computing a partial derivative for the actual Log-Likelihood-Ratio values in the one or more n-regions.

6. (Currently Amended) The method of ~~soft decision decoding according to~~ claim 5 wherein the step of approximating further comprises determining a slope for the actual Log-Likelihood-Ratio value for each of the plurality of m bits per symbol.

7. (Currently Amended) The method of ~~soft decision decoding according to~~ claim 6 wherein

2   the slope is determined by use of a linear equation, wherein the linear equation utilizes

3   the constant a_n.

1   8.   (Currently Amended) The method of ~~soft decision decoding according to~~ claim 6 wherein

2   the step of approximating further comprises quantizing the slope for each m bit per

3   symbol.

1   9.   (Currently Amended) The method of ~~soft decision decoding according to~~ claim 8 wherein

2   the step of quantizing is performed using a quantizing equation

$$Quantize = \left(\ LLR \frac{2^{SOFT\_BITS-1}}{qLIMIT} + 2^{SOFT\_BITS-1} \ \right)$$

5   wherein the SOFT_BITS value and the qLIMIT value are dependent on the signal to

6   noise ratio.

1   10.   (Currently Amended) A method of <u>generating soft value vectors for</u> soft decision

2   decoding over a channel <u>within a TPC system</u>, the method comprising the steps of:

3   a.   receiving an input signal over the channel, wherein the input signal has a plurality

4   of m bits per symbol;

5   b.   calculating an actual Log-Likelihood-Ratio value for each of the plurality of m

6   bits per symbol <u>using embedded software on the system;</u>

7   c.   determining a slope for the actual Log-Likelihood-Ratio value of each m bit; and

8   d.   quantizing the slope for each m bit per symbol and generating a

9   Log-Likelihood-Ratio result, wherein the Log-Likelihood-Ratio value is

10   independent of noise over the channel.

1   11.   (Currently Amended) The method of ~~soft decision decoding according to~~ claim 10 further

2   comprising separating the actual Log-Likelihood-Ratio values into one or more n-regions,

3   wherein n is an integer.

1   12.   (Currently Amended) The method of ~~soft decision decoding according to~~ claim 11

2   further comprising determining a constant a_n by computing a partial derivative for the

3   actual Log-Likelihood-Ratio values in the one or more n-regions.

1   13.   (Currently Amended) The method of ~~soft decision decoding according to~~ claim 12

2   wherein the slope is determined by use of a linear equation, wherein the linear equation

3   utilizes the constant a_n.

1   14.   (Currently Amended) The method of ~~soft decision decoding according to~~ claim 10

2   wherein the step of quantizing is performed using a quantizing equation

3

$$Quantize = \left(\ LLR \frac{2^{SOFT\_BITS-1}}{qLIMIT} + 2^{SOFT\_BITS-1} \ \right)$$

5   wherein the SOFT_BITS value and the qLIMIT value are dependent on the signal to

6   noise ratio.

1   15.   (Currently Amended) A method of <u>generating soft value vectors for</u> soft decision

2   decoding over a modulated channel <u>within a TPC system</u> wherein a signal to noise ratio

3   ~~may be~~ <u>is</u> calculated over the channel, the method comprising the steps of:

4   a.   receiving an input signal over the channel, wherein the input signal has a plurality

5   of m bits per symbol;

6   b.   calculating an actual Log-Likelihood-Ratio value for each of the plurality of m

7   bits per symbol <u>using embedded software on the system</u>, wherein the actual

8   Log-Likelihood-Ratio value includes a SOFT_BITS value for each of the plurality

9   of m bits per symbol;

10   c.   separating the actual Log-Likelihood-Ratio values into one or more n-regions,

11   wherein n is an integer;

12   d.   determining a constant, a_n by computing a partial derivative for the actual Log-

13   Likelihood-Ratio values in the one or more n-regions;

14   e.   calculating a slope by use of a linear equation, wherein the linear equation utilizes

15   the constant a_n; and

16   f.   quantizing the constant a_n by utilizing the quantizing equation

17

18
$$Quantize = \left(\ LLR \frac{2^{SOFT\_BITS-1}}{qLIMIT} + 2^{SOFT\_BITS-1} \ \right)$$

19   wherein the SOFT_BITS value and qLIMIT are dependent on the signal to noise ratio, the

20   quantizing equation generating a quantized Logarithmic-Likelihood-Ratio result substantially

21   independent of the signal to noise ratio over the channel.

1   16.   (Currently Amended) A Logarithmic Likelihood Ratio module <u>for generating soft value</u>

2   <u>vectors</u> for soft decision decoding over a modulated channel <u>within a TPC system</u>, the

3   Logarithmic Likelihood Ratio module comprising:

4   a.   an input module for receiving a plurality of ~~(I,Q)~~ data symbols;

5   b.   a <u>soft-ware based</u> modulation unit for determining a modulation scheme for

6   calculating a Logarithmic Likelihood Ratio result for the plurality of ~~(I,Q)~~ data

7   symbols, wherein the Logarithmic Likelihood Ratio result is substantially

8   independent of a signal to noise ratio over the modulated signal; and

9   c.   a converter module for converting the Logarithmic Likelihood Ratio result of the

10   plurality of ~~(I,Q)~~ data symbols into unsigned values.

1   17.   (Previously Added) The Logarithmic Likelihood Ratio module according to claim 16

2   further comprising a gain module for amplifying the plurality of data symbols by a

3   multiplicative factor.

1   18.   (Currently Amended) The Logarithmic Likelihood Ratio module according to claim 16

2   further comprising a PSK module for calculating the Logarithmic Likelihood Ratio result

3   by determining a slope of the plurality of ~~(I,Q)~~ data symbols in a phase shift key

4   modulation scheme.

1   19.   (Currently Added) The Logarithmic Likelihood Ratio module according to claim 16

2   further comprising a QAM module for calculating the Logarithmic Likelihood Ratio

3   result by a determining a slope of the plurality of ~~(I,Q)~~ data symbols over a quadrature

4   amplitude modulation scheme.

1   20.   (Previously Added) The Logarithmic Likelihood Ratio module according to claim 19
2   further comprising a second QAM module for calculating the Logarthimic Likelihood
3   Ratio result for a portion of the m bits in parallel with the QAM module.

1   21.   (Previously Added) The Logarithmic Likelihood Ratio module according to claim 16
2   further comprising a multiplexer coupled to the modulation unit, wherein multiplexer
3   provides the Logarithmic Likelihood Ratio result to the converter module.